Up To Date

NASA IV&V Facility
Educator Resource Center
Newsletter

December, 2008

Volume 1, Issue 5

NASA IV&V Facility ERC

Nations Around the World Mark 10th Anniversary of International Space Station

Image above: The International Space Station is seen from space shuttle Discovery as the two spacecraft begin their relative separation, ending docked operations during the STS-124 mission. Credit: NASA

Nations around the world gathered together to mark a milestone in space exploration on November 20, celebrating the 10th birthday of a unique research laboratory, the International Space Station.

Now the largest spacecraft ever built, the orbital assembly of the space station began with the launch from Kazakhstan of its first bus-sized component, Zarya, on Nov. 20, 1998. The launch began an international construction project of unprecedented complexity and sophistication.

The station is a venture of international cooperation among NASA, the Russian Federal Space Agency, Canadian Space Agency, Japan Aerospace Exploration Agency, or JAXA, and 11 members of the European Space Agency, or ESA: Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland and the United Kingdom. More than 100,000 people in space agencies and contractor facilities in 37 U.S. states and throughout the world are involved in this endeavor.

"The station's capability and sheer size today are truly amazing," said International Space Station Program Manager Mike Suffredini. "The tremendous technological achievement in orbit is matched only by the cooperation and perseverance of its partners on the ground. We have overcome differences in language, geography and engineering philosophies to succeed."

The station's mass has expanded to more than 627,000 pounds, and its interior volume is more than 25,000 cubic feet, comparable to the size of a five-bedroom house. Since Zarya's launch as the early command, control and power module, there have been 29 additional construction flights to the station: 27 aboard the space shuttle and two additional Russian launches.

One hundred sixty seven individuals representing 15 countries have visited the complex. Crews have eaten some 19,000 meals aboard the station since the first crew took up residence in 2000. Through the course of 114 spacewalks and unmatched robotic construction in space, the station's truss structure has grown to 291 feet long so far. Its solar arrays now span to 28,800 square feet, large enough to cover six basketball courts.

On Nov. 20, the space station completed 57,309 orbits of the Earth, a distance of 1,432,725,000 miles. If the station had been traveling in a straight line instead of in orbit, it would have passed the orbit of Pluto and be in the outer reaches of our solar system.

Expedition 18 Commander Mike Fincke, now aboard the station. "Everything we're learning so close to home, only 240 miles away from the planet, we can apply to the moon 240,000 miles away."

For complete article, visit: www.nasa.gov/mission_pages/station/maim/10th_anniversary.html

To take a virtual tour of the International Space Station and learn more about the current mission, visit: www.nasa.gov/station

To find out how to see the station from your own backyard, visit: http://spaceflight.nasa.gov/realdata/sightings

Inside:

Important Dates:

December TacSat-3 Launch

December 3, Astro-Venture Workshop at ERC

December 11, NASA Portal Gets Interactive Workshop at ERC

December 13, Energy Series: Hydrogen Workshop at ERC

Enjoy your Holiday Break!

Racers Get Ready! NASA's Great Moonbuggy Registration Begins!

Each year, NASA challenges high schools and colleges across the country and the world to design and build lightweight, human-powered moonbuggies. The U.S. Space and Rocket Center in Huntsville Alabama hosts the two-day event. Registration for the 2009 race closes Feb. 1. See http://moonbuggy.msfc.nasa.gov/ for more information.

Upcoming Workshops: NASA IV&V Facility ERC

Astro-Ventrue
December 3, 6:00-8:00 Educators of grades 5-8 are invited to discover Astro-Venture, a program to where NASA scientists help students study astrobiology as they search for and design a planet habitable to humans.

NASA Portal Gets Interactive
December 11, 6:00-8:00 elementary and middle school educators will learn about the interactive features on www.nasa.gov.

which make teaching earth science, space, and general NASA information fun for the classroom.

Energy Series: Hydrogen
December 13, 10:00-4:00 Educators of grades 5-12 will learn activities from the Kid Wind Project (NEED) to dispel myths about wind energy and electricity.

Don't' Forget to Register at least one week in advance!

January Workshops:

Robotics, Jan 19, 10:00-4:00. Educators of grades 3-8, become certified to use our Robotics Kit in your educational setting!
Night Sky in the Day Time, grades K-8, January 24, 9:00-12:00 Get certified to use our StarLab Portable Planetarium!
Line Up with Math, Jan 28, 6:00-8:00. Educators of grades 5-12 can explore this web based Air Traffic Control Simulator to teach distance-rate-time problems.

Featured NASA IV&V Equipment Loan Kit: STARLAB Portable Planetarium

Image Credit: StarLab.com

The STARLAB Portable Planetarium has been a favorite part of the NASA IV&V Facility ERC Equipment Loan Program for years. The planetarium can hold your entire class with a 30' X 30' footprint and requires a 13' ceiling.

While this equipment is most commonly used to teach astronomy concepts, that is not its limitation for your educational setting. The cylinders we have to loan with the StarLab for you include: African Mythology, Biological Cell, Constellations, Earth, Ancient Egyptian Culture, Greek Mythology, Lewis and Clark Celestial Navigation, Maya Skies, Ocean Currents, Plate Tectonics, Solar System and Galaxies, Starfield, Urban Starfield, Weather, and Moon. Each cylinder has designed curriculum and we are happy to provide training using any of the cylinders.

Interested in using the StarLab in your educational setting? Schedule a workshop with ten or more educators in your area or visit us at the ERC. Our next workshop granting certification for the StarLab at the ERC will be January 24 from 9:00-12:00 and the focus will be the Night Sky. Registrations and questions can be directed to Marcie at 304-367-8436 or marcie.raol@ivv.nasa.gov.

Mars Rover Team Sets Low-Power Plan for NASA's Spirit

After assessing data received from NASA's Mars Exploration Rover Spirit on Nov 13, mission controllers laid out plans for the rover to conserve its modest energy during the next few weeks.

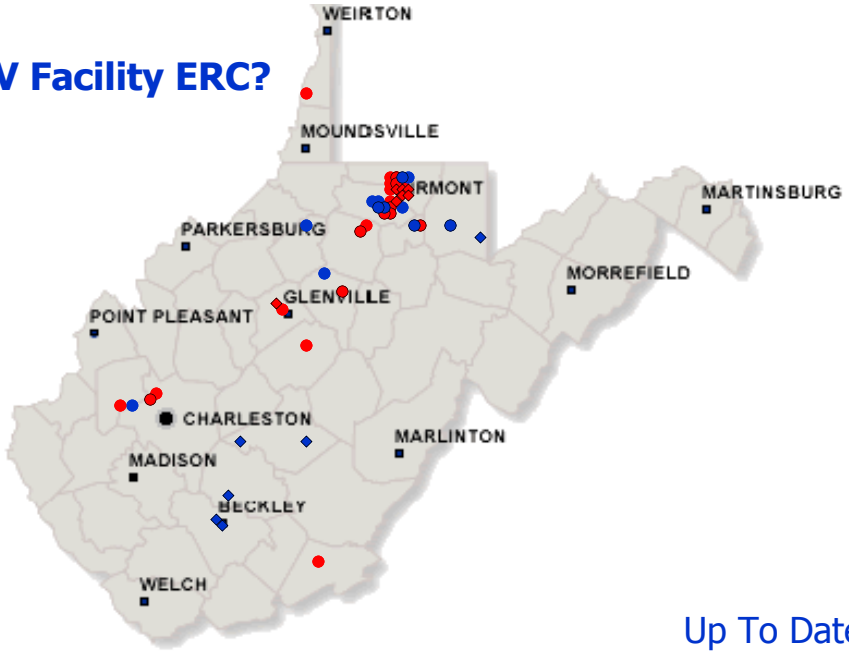
Dust buildup on solar panels worsened after a dust storm, allowing only 30 percent of light to hit the panels.

The four-day plan transmitted on Nov. 14 tells Spirit to keep some heaters turned off and conduct limited observations and communications. A plan for lower power sequences will be followed for the rest of the month.

Read more at http://marsrovers.jpl.nasa.gov/newsroom/pressreleases/20081114a.html

Where in WV is the NASA IV&V Facility ERC?

- ♦ November Equipment Loan
- ♦ November Workshops
- ♦ November Video Conferencing
- • 2008-2009 Equipment Loan
- • 2008-2009 Workshop
- • 2008-2009 Video Conferencing



Featured STEM Career: NASA Educator Astronaut

Job Description:
Mission Specialist on the International Space Station. Work to support the implementation of technology for the station. Help NASA in the development of new ways to connect space exploration with the classroom and inspire the next generation of explorers, including speaking to students.

Quote from Current Job Holder:
On The Educator Astronaut application, she described the opportunity as "a combination of my dreams."

Current Job Holder Qualifications:
Experience teaching Earth Science and Astronomy, and coaching cross country and the Science Olympiad. Bachelor's Degree in Geology. Completion of two-year astronaut candidate training. Currently studying robotics, computer networking, and Russian.

Learn More: Visit www.nasa.gov/audience/foreducators/stseducation/stories/Dottie_Metcalf_Lindenburger_Profile.html

Educator Astronauts Dottie Metcalf-Lindenburger, Ricky Arnold and Joe Acaba experience microgravity during astronaut training on a NASA aircraft. Image Credit: NASA

"Once you start getting involved in a project, you take ownership in it. Then to see it fly is rewarding." ~ Metcalf-Lindenburger

STS-126 MISSION SUMMARY NOVEMBER 2008

Space shuttle Endeavour's STS-126 flight, which launched November 14, will feature important repair work and prepare the International Space Station to house six crew members for long-duration missions. The 15-day flight with its four planned spacewalks (each approximately 6.5 hours) will primarily focus on servicing the station's two Solar Alpha Rotary Joints, which allow its solar arrays to track the sun.

Endeavour will carry about 32,000 pounds, which will include supplies and equipment necessary to double the crew size from three to six members in spring 2009. The new station cargo includes two water recovery systems racks for recycling urine into potable water, a second toilet system, two new food warmers, a food refrigerator, an experiment freezer, a combustion science experiment rack, a resistance exercise device, additional sleeping quarters, and a resistance exercise device, . The shuttle also will deliver a new crew member and bring back another after more than five months aboard the station.

By The Numbers:
STS-126 is the:
- 124th space shuttle flight
- 27th flight to the station
- 22nd flight for Endeavour
- 4th flight in 2008.

More information can be found at www.nasa.gov/mission_pages/shuttle/main/index.html

Featured NASA Product: Clickable Space Suit

The Clickable Space Suit is just one part of the new NASA Education Spacesuits and Spacewalks Web site. www.nasa.gov/audience/foreducators/spacesuits/home/index.html

Engage your students in the wonders of space as they learn about spacesuits and spacewalks using: the Clickable Spacesuit to learn about the parts of a spacesuit, videos about future spacesuits and hard-to-do moves in a spacesuit, the Spacesuit History Gallery, additional Educational Activities, and information about spacesuit designers and engineers who create and test spacesuits.

NASA's Extravehicular Mobility Unit, or EMU, is like a personal mini-spacecraft. Learn about spacesuits with this interactive feature as you mouse over the parts of the spacesuit and learn why each piece is important. Image Credit: NASA

Free Web Seminars

http://learningcenter.nsta.org/products/webseminars.aspx

NSTA/FDA: Teach Science Concepts and Inquiry with Food:
The Chemistry of Color Additives
Dec 2, 6:30
FDA Science, Dec 18, 6:30

NSTA/NSDL: Chemistry Comes Alive III: Water, Dec 9, 6:30

NSTA: Igniting Students' Interests in Science Careers,
Dec 10, 6:30 and Jan 8, 6:30

NSTA: Force and Motion: Stop Faking It! Dec 11, 6:30 and Jan 15, 6:30

NSTA: Discover the Universe – From Galileo to Today: IYA – Advances in technology and discoveries of the last 400 Years
Dec 16, 6:30 and Tues, Jan 20, 6:30

NSTA: Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry
Inquiry in the Primary Grades,
Dec 17, 6:30
Designing Lessons Using the 5-E's,
Jan 22, 6:30

NASA Mars Reconnaissance Orbiter Detects Buried Glaciers on Mars.

More at www.nasa.gov/mission_pages/MRO/news/mro-20081120.html

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We're on the web!

http://erc.ivv.nasa.gov

Submit story ideas and pictures to marcie.raol@ivv.nasa.gov

The NASA Independent Verification and Validation Facility Educator Resource Center's goal is to serve teachers, informal educators, and preservice teaches to enable them to reach their goals. Through a grant with Fairmont State University, the NASA IV&V Facility ERC provides materials, equipment for loan, and professional development workshops both at the facility and around the state of West Virginia (scheduled upon request) for educators that reflect NASA's current research and technology.

FAIRMONT STATE UNIVERSITY

Independent Verification & Validation Facility

NASA Invites Students to Name New Mars Rover

NASA is looking for the right stuff, or in this case, the right name for the next Mars rover. NASA, in cooperation with Walt Disney Studios Motion Pictures' movie WALL-E from Pixar Animation Studios, will conduct a naming contest for its car-sized Mars Science Laboratory rover that is scheduled for launch in 2009.

The contest is open to students 5 to 18 years old who attend a U.S. school and are enrolled in the current academic year. To enter the contest, students will submit essays by Jan. 25, 2009 explaining why their suggested name for the rover should be chosen. In March 2009, the public will have an opportunity to rank nine finalist names via the Internet as additional input for judges to consider during the selection process. NASA will announce the winning rover name in April 2009.

Disney will provide prizes to students submitting winning essays, including a trip to NASA's Jet Propulsion Laboratory in Pasadena, Calif., where the rover is under construction. The grand prize winner will have an opportunity to place a signature on the spacecraft and take part in the history of space exploration.

Engineers stand with the Mars Science Laboratory
Credit: NASA/JPL

The naming contest partnership is part of a Space Act Agreement between NASA and Disney designed to use the appeal of WALL-E in educational and public outreach efforts.

The Mars Science Laboratory rover will be larger and more capable than any craft previously sent to land there. It will check whether the environment in a selected landing region ever has been favorable for supporting microbial life. The rover will search for minerals that formed in the presence of water and look for several chemical building blocks of life.

Additional assignments include imaging its surroundings in high definition, analyzing rocks with a high-powered laser beam, inspecting rocks and soil with a six -foot robotic arm, and cooking and sniffing rock powder delivered from a hammering drill to investigate what minerals are in Martian rocks.

JPL, a division of the California Institute of Technology, Pasadena, manages the Mars Science Laboratory Project for the NASA Science Mission Directorate, Washington.

Information about the contest is available at http://marsrovername.jpl.nasa.gov.

More information on Mars Science Laboratory is at http://marsprogram.jpl.nasa.gov/msl/.

Complete Article: www.nasa.gov/mission_pages/mars/news/msl-20081118.html